

What is claimed is:

1. A medical device for retrieving an intravascular device within a body lumen, comprising:

an elongated shaft having a proximal section and a distal section;

an inflation lumen extending from the proximal section of the elongated shaft to the distal section of the elongated shaft; and

an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen, the expandable sleeve configured to unfold along an adhesive layer disposed about a portion of the elongated shaft for retrieving the intravascular device within said body lumen.

2. The medical device of claim 1, further comprising a retrieval lumen extending from the proximal section of the shaft to an opening at the distal end of the elongated shaft.

3. The medical device of claim 2, wherein the retrieval lumen includes a distal flared region.

4. The medical device of claim 2, wherein the retrieval lumen is operatively coupled to a vacuum source.

5. The medical device of claim 2, wherein the retrieval lumen includes a lubricious coating.

6. The medical device of claim 1, wherein the inflation lumen includes an inflation port disposed through an external wall of the elongated shaft.

7. The medical device of claim 1, wherein the inflation lumen is operatively coupled to a pressure source.

8. The medical device of claim 1, wherein the expandable sleeve is configured to unfold along the adhesive layer when inflated to a sufficient pressure.

9. The medical device of claim 1, wherein the expandable sleeve is configured to radially and axially expand to a pre-defined shape when inflated to a sufficient pressure.

10. The medical device of claim 1, wherein the expandable sleeve is formed of a non-compliant material.

11. The medical device of claim 1, wherein the expandable sleeve is formed of a compliant material.

12. The medical device of claim 1, wherein the expandable sleeve is formed at least in part of polyethylene.

13. The medical device of claim 1, wherein the expandable sleeve includes an inner layer and an outer layer.

14. The medical device of claim 13, wherein the inner layer of the expandable sleeve is thinner than the outer layer of the expandable sleeve.

15. The medical device of claim 13, wherein the expandable sleeve includes cutting means.

16. The medical device of claim 15, wherein said cutting means comprises at least one cutting blade or edge.

17. The medical device of claim 1, wherein said intravascular device is a clot puller.

18. A medical device for retrieving an intravascular device within a body lumen while preventing proximal embolus flow, comprising:

an elongated shaft having a proximal section, a distal section, and an external wall;

an inflation lumen extending from the proximal section of the elongated shaft to the distal section of the elongated shaft, the inflation lumen including an inflation port disposed through the external wall of the elongated shaft;

an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen, the expandable sleeve configured to unfold along an adhesive layer disposed about a portion of the elongated shaft for retrieving the intravascular device within said body lumen; and

a retrieval lumen extending from the proximal section of the shaft to an opening at the distal end of the shaft.

19. The medical device of claim 18, wherein the retrieval lumen includes a distal flared region.

20. The medical device of claim 18, wherein the retrieval lumen is operatively coupled to a vacuum source.

21. The medical device of claim 18, wherein the retrieval lumen includes a lubricious coating.

22. The medical device of claim 18, wherein the inflation lumen is operatively coupled to a pressure source.

23. The medical device of claim 18, wherein the expandable sleeve is configured to unfold along the adhesive layer when inflated to a sufficient pressure.

24. The medical device of claim 18, wherein the expandable sleeve is configured to radially and axially expand to a pre-defined shape when inflated to a sufficient pressure.

25. The medical device of claim 18, wherein the expandable sleeve is formed of a non-compliant material.

26. The medical device of claim 18, wherein the expandable sleeve is formed of a compliant material.

27. The medical device of claim 18, wherein the expandable sleeve is formed at least in part of polyethylene.

28. The medical device of claim 18, wherein the expandable sleeve includes an inner layer and an outer layer.

29. The medical device of claim 28, wherein the inner layer of the expandable sleeve is thinner than the outer layer of the expandable sleeve.

30. The medical device of claim 28, wherein the expandable sleeve includes cutting means.

31. The medical device of claim 30, wherein said cutting means comprises at least one cutting blade or edge.

32. The medical device of claim 18, wherein said intravascular device is a clot puller.

33. A system for retrieving a blood clot disposed at a target site within a blood vessel, comprising:

an intravascular device configured to engage the blood clot adjacent the target site; and

a balloon catheter configured to intussuscept the intravascular device and blood clot while limiting the proximal flow of blood within the blood vessel, the balloon catheter comprising an elongated shaft having a proximal section and a distal section, an inflation lumen extending from the proximal section of the elongated shaft to the distal section of the elongated shaft, a retrieval lumen configured to receive at least part of the intravascular device, and an expandable sleeve disposed about the distal section of the elongated shaft and in fluid communication with the inflation lumen.

34. The system of claim 33, wherein the expandable sleeve is configured to unfold distally when inflated.

35. The system of claim 33, wherein the expandable sleeve is configured to unfold distally along an adhesive layer disposed about a portion of the elongated shaft.

36. The system of claim 33, wherein the expandable sleeve is configured to radially and axially expand to a pre-defined shape when inflated.

37. A method of retrieving a foreign object from a target site within a body lumen, comprising the steps of:

providing an intussuscepting balloon catheter comprising an elongated shaft having a proximal section and a distal section, an inflation lumen, a retrieval lumen, and an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen;

advancing the intussuscepting balloon to the target site;

inflating the expandable sleeve; and

intussuscepting the foreign object within the expandable sleeve.

38. The method of claim 37, further comprising the step of engaging an intravascular device at the target site.

39. The method of claim 38, wherein the step of engaging the intravascular device at the target site is performed prior to the step of inflating the expandable sleeve.

40. The method of claim 38, wherein the step of engaging the intravascular device at the target site is performed during the step of inflating the expandable sleeve.

41. The method of claim 38, further comprising the step of retrieving the intravascular device at least in part within the retrieval lumen.

42. The method of claim 41, wherein the retrieval lumen is operatively coupled to a vacuum source.

43. The method of claim 42, wherein said retrieval step is accomplished at least in part by aspiration.

44. The method of claim 41, wherein said retrieval step is accomplished at least in part by retracting the guidewire proximally while holding the intussuscepting balloon catheter stationary.

45. The method of claim 37, wherein the step of inflating the expandable sleeve comprises:

inflating the expandable sleeve to a first state, causing the expandable sleeve to radially expand and distend the body lumen; and

continuing to inflate the expandable sleeve to a second state, causing the expandable sleeve to unfold and expand distally.

46. A method of retrieving a foreign object from a target site within a body lumen, comprising the steps of:

providing an intravascular device coupled to the distal portion of a guidewire;



providing an intussuscepting balloon catheter comprising an elongated shaft having a proximal section and a distal section, an inflation lumen, a retrieval lumen, and an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen;

advancing the guidewire and intravascular device to the target site;

engaging the intravascular device at the target site;

advancing the intussuscepting balloon catheter along the guidewire to a location adjacent the intravascular device;

inflating the expandable sleeve; and

intussuscepting the foreign object and at least part of the intravascular device within the expandable sleeve; and

retrieving the intravascular device at least in part within the retrieval lumen.

47. The method of claim 46, wherein the step of engaging the intravascular device at the target site is performed prior to the step of inflating the expandable sleeve.

48. The method of claim 46, wherein the step of engaging the intravascular device at the target site is performed during the step of inflating the expandable sleeve.

49. The method of claim 46, further comprising the step of retrieving the intravascular device at least in part within the retrieval lumen.

50. The method of claim 46, wherein the retrieval lumen is operatively coupled to a vacuum source.

51. The method of claim 50, wherein said retrieval step is accomplished at least in part by aspiration.

52. The method of claim 49, wherein said retrieval step is accomplished at least in part by retracting the guidewire proximally while holding the intussuscepting balloon catheter stationary.

53. The method of claim 46, wherein the step of inflating the expandable sleeve comprises:

inflating the expandable sleeve to a first state, causing the expandable sleeve to radially expand and distend the body lumen; and

continuing to inflate the expandable sleeve to a second state, causing the expandable sleeve to unfold and expand distally.

54. A method of retrieving a foreign object from a target site within a body lumen, comprising the steps of:

providing an intravascular device coupled to the distal portion of a guidewire;

providing an intussuscepting balloon catheter comprising an elongated shaft having a proximal section and a distal section, an inflation lumen, a retrieval lumen, and

an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen;

advancing the guidewire and intravascular device to the target site;

engaging the intravascular device at the target site;

advancing the intussuscepting balloon catheter along the guidewire to a location adjacent the intravascular device;

inflating the expandable sleeve to a first state, causing the expandable sleeve to radially expand and distend the body lumen; and

continuing to inflate the expandable sleeve to a second state, causing the expandable sleeve to unfold and expand distally;

intussuscepting the foreign object and at least part of the intravascular device within the expandable sleeve; and

retrieving the intravascular device at least in part within the retrieval lumen.

55. A method of retrieving a foreign object from a target site within a body lumen, comprising the steps of:

providing an intussuscepting balloon catheter comprising an elongated shaft having a proximal section and a distal section, an inflation lumen, a retrieval lumen, and an expandable sleeve coupled to the distal section of the elongated shaft and in fluid communication with the inflation lumen;

providing a vacuum source in fluid communication with the retrieval lumen;

advancing the intussuscepting balloon catheter along a guidewire to the target site;

activating the vacuum source to aspirate the foreign object at least in part within the retrieval lumen;

inflating the expandable sleeve; and

intussuscepting the foreign object within the expandable sleeve.